**Date\_\_\_\_\_\_\_\_ \_Time 7:20 Subject Cell Transport WebQuest Grade\_10**

**Pennsylvania/National Standards:**

* Keystone Anchor
  + BIO.A.2.2: Describe and interpret relationships between structure and function at various levels of biochemical organization (i.e. atoms, molecules, and macromolecules)
* PDE SAS
  + S11.A.3.2.3 Describe how relationships represented in models are used to explain scientific or technological concepts (e.g., dimensions of the solar system, life spans, size of atomic particles, topographic maps).
  + S11.A.1.1.5: Analyze or compare the use of both direct and indirect observation as means to study the world and the universe (e.g., behavior of atoms, functions of cells, birth of stars).
  + S11.B.1.1.1: Explain how structure determines function at multiple levels of organization (e.g., chemical, cellular, anatomical).
  + S11.B.1.1.3: Compare and contrast cellular processes (e.g., photosynthesis and respiration, meiosis and mitosis, protein synthesis and DNA replication).
* National Science Education Standards
  + Standard C 1.1: Cells have particular structures that underlie their functions. Every cell is surrounded by a membrane that separates it from the outside world. Inside the cell is a concentrated mixture of thousands of different molecules which form a variety of specialized structures that carry out such cell functions as energy production, transport of molecules, waste disposal, synthesis of new molecules, and the storage of genetic material.

**Essential Understanding(s)/Key Concepts/Skills:**

* Review cell membrane structure, cell membrane function, active transport, passive transport, diffusion, osmosis, exocytosis, endocytosis, pumps.

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| **Instructional Objectives** | **Aligned Assessments** |
| 1. Given a webquest activity sheet and computer, the student will explain the structure and function of the cell membrane with 80% accuracy.  2. Given a webquest activity sheet and computer, the student will explain the process and importance of cell transport methods with 80% accuracy. | 1. Webquest handout, mid-term exam questions.  2. Webquest handout, mid-term exam questions. |

**Review of Skills/Content:**

The information learned in the previous lessons regarding the cell membrane and cell transport may be reviewed before this lesson. Students will need to recall the information they learned about the structure of the cell membrane and its functions as well as passive and active transport.

**Materials:**

* Student webquest handouts
* Student computers with internet access
* Teacher computer with projection system and internet access
* Student final project handouts

**Behavioral Expectations:**

Students will be expected to follow all posted school and classroom rules. Students will be expected to pay attention to the teacher and respect the teacher and classmates at all times. Since the students will be working on computers, they will be expected to actively complete their assignments while maintaining focus and staying on-task. Students will also be expected to use the computers carefully so they do not break them.

**Methods of Assessment:**

The lesson objectives will be formatively assessed during the lesson through the use of informal questioning. The webquest activity sheets will be collected upon completion of the activity and assessed by the teacher.

**General/Specific Accommodations for Students (Diverse/English Language Learners):**

In order to accommodate English language learners and students with special needs, access to classroom aides such as textbooks will be provided so students may look up words they are unfamiliar with. The instruction will be delivered clearly and concisely. Responses to questions may be modeled and extra time may be given to complete assignments. Students may be allowed to work in groups and may be allowed to hand in a single lab sheet for the entire group. The webquest activity sheet may be read aloud to students with difficulty reading or understanding the instructions.

**Instructional Sequence:**

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| **Lesson Implementation** | **Anticipated Student Responses** |
| **Introductory Activity (Anticipatory Set):**  The anticipatory set will consist of the teacher handing out a piece of paper to the students and asking them to divide it into 3 columns labeled “know”, “want to know”, and “learned”. The students will then fill in the first 2 columns of the paper with what they already know about the cell membrane and transport after the previous lessons in the unit and what they still want to learn about the cell membrane and transport.  The class will then review the daily objectives which will be written on the board. | The students should sit quietly and complete their papers  Some students may not write their papers so the teacher will have to orbit the room to help students who need help and make sure all students are filling out their papers. |
| **Modeling/Demonstration:**  To begin the modeling/demonstration, the teacher will gain the students’ attention by passing out the webquest handouts for the day. The students will then get their computers and log on to their student accounts. Once they are ready, the teacher will use the computer and projection system to show the students how to get to the websites in the activity. The teacher will then demonstrate what the students should be doing by showing them how to do the first section together. | During the modeling/demonstration, it is expected that the students will follow the instruction and pay attention to the instructor. Some students may lack attention so it will be important for the instructor to make sure to maintain student focus during this time. |
| **Guided Practice/Feedback:**  After showing the students how to complete the first few questions on the activity, the teacher will have the class work on the next part of the activity together. The teacher will show all of the steps on the projector while the students will be expected to follow along and complete the activity on their computers at the same time. The students will work together to answer the questions on their activity sheets while the teacher provides constructive feedback. | The students should fully participate in the guided practice and to use the feedback provided by the teacher to guide their learning and help them understand the concepts being taught.  Some students may get off-task and not follow along on their computers. They may also be on websites other than those related to the activity. The teacher will have to check to make sure the students stay on-task. |
| **Independent Practice:**  Once the students have had group practice, they will be asked to independently follow the directions on their activity sheets in order to complete the webquest on their own. They will be given the rest of the period to complete the activity and any students that do not finish will be asked to finish the assignment at home or in the library during study hall. | Some students may not want to participate in the activity. The teacher will have to make sure all students are participating and completing their assignment.  Some students may be on websites other than those related to the activity. The teacher will have to check to make sure the students stay on-task. |
| **Discussion/Essential Questions:**   * What are the different types of cell transport? * Why is cell transport important? | The students should be able to answer these essential questions by the end of the lesson. |
| **Formative Assessment:**  The formative assessment for this lesson will consist of the students’ answers to informal questioning throughout the lesson as well as their webquest activity handouts. The information gained from these assessments will allow the teacher to make sure students understand the key concepts being covered in the lesson and adapt future lessons. |  |
| **Closure (Review/Preview):**  To close this lesson, the students will be asked to complete their KWL sheet that they started in the anticipatory set. They will be asked to write down what they learned about the cell membrane or cell transport from the webquest activity. The class will then discuss what was learned and if there are still any questions on the topic before the final project during the next lesson. The teacher will then hand out the Cell Transport Final Project form to the students and ask them to look over it and bring any supplies they want for class tomorrow. | The students should participate in the discussion and should provide their own unique input. They should also think critically about the information they learned over the course of the unit so far. Some students may not participate, so the teacher should guide them into discussion by asking if they agree or disagree with other students. |
| **Extension Activities:**  The extension activity that will be used if the lesson is finished before the end of the period will consist of asking the students to look over the review pages in their textbooks regarding the concepts that were reviewed during this lesson and the unit up to this point | The students should maintain focus while completing this activity, but some may lose focus since the period will be almost over. The teacher will need to help maintain student focus. |

**Correction Procedures/Potential Areas of Difficulty:**

There are no content areas which should pose a difficulty to students in this lesson because it is a review of what they have already learned throughout this unit. The only problems may be associated with computer use. Some students may have trouble accessing websites, using the computer, or finding information. The teacher will have to demonstrate these skills during the modeling/demonstration portion of the lesson.

**Summative Assessment:**

**Assessment Items**

* This lesson is a review of all previous lessons, so assessment items will be the same as those from the previous lessons in this unit.

**Answers and Scoring Criteria**

* This lesson is a review of all previous lessons, so assessment items will be the same as those from the previous lessons in this unit.

**Modified Assessment Items for Students with Disabilities and English Language Learners:**

* This lesson is a review of all previous lessons, so assessment items will be the same as those from the previous lessons in this unit.

**Reflections:**

**Sources:**

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